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ENTOMOLOGY.—*Notes on Trichopodini (Diptera, Larvaevoridae), with description of a new parasite of cotton stainers in Puerto Rico.*[1] Curtis W. Sabrosky, Bureau of Entomology and Plant Quarantine.

In Puerto Rico attempts were made in 1941 and 1942 to introduce from Peru a larvaevorid fly, *Acaulona peruviana* Townsend, as a parasite of cotton stainers, *Dysdercus* spp. Subsequent collections to determine whether that species had become established revealed the presence of an undescribed parasite, apparently a native species. In the taxonomic study of this new species, the New World genera of the tribe Trichopodini (*sensu* Townsend) were reviewed, and although a complete revision is not possible at this time, some results may be of aid to other workers in the future.

For convenience, the present paper is confined to the Trichopodini in the sense of Townsend. Certainly some genera of Townsend's Phasiini, however, are much closer to Trichopodini than to other phasiine genera, especially in the type of male and female genitalia (e.g., *Ectophasiops* Townsend). A similar distinction has been pointed out by Brooks and by Dupuis in recognizing two groups of genera within the Phasiini, based on reproductive habit and type of female genitalia. A natural grouping would seem to call for considerable rearrangement, with combination of parts or all of several tribes.

In almost all proposed genera of the Trichopodini either the fundamental structure is so similar or the characters so overlap that one must perforce either synonymize extensively or, with Townsend, construct unsatisfactory keys on variable and ineffective characters. One feature that seems not to have been used previously is the chaetotaxy of the scutellum, and this is so markedly different in two groups that it is a significant and highly useful initial division. In some cases, also, it is possible that differences in the form of the genitalia may justify generic recognition.

Complete citations of genotypes have been omitted for purposes of this contribution. They are given in full in Townsend (*Manual of myiology*, pt. 7: 9–35. 1938).

KEY TO THE NEW WORLD GENERA OF TRICHOPODINI

Key to Groups

1. Scutellum with basal scutellar bristles much longer than apicals, widely divergent, and inserted midway between basal corner of scutellum and apical bristles (Fig. 8); apical cell long petiolate. *Xanthomelanodes* complex

   Scutellum with basal bristles not obviously longer than apicals, directed posteriorly or curving mesad, and inserted quite near basal corner of scutellum (Fig. 9); apical cell open, closed at margin, or very short petiolate.. 2

2. Posterior tibia ciliate dorsally with a row of close-set, flattened bristles, which may or may not be obviously longer than diameter of tibia ..... *Trichopoda* complex

   Posterior tibia entirely without flattened bristles..... *Acaulona* complex

Xanthomelanodes Complex

1. Second segment of arista elongated, 3 times length of basal segment and 5 times it own breadth; third antennal segment elongated, 3 times length of second segment. *Xenophasia* Townsend

   First 2 segments of arista short; third antennal segment not elongated. *Xanthomelanodes* Townsend

Trichopoda Complex

1. Postcoxal area, between hind coxae and first abdominal sternite, membranous and characteristically sunken or shriveled; front somewhat narrowed at vertex, the sides parallel on basal half, then suddenly diverging (Fig. 4) 2

   Postcoxal area sclerotized, the lateral plates not distinctly separated by a sunken, membranous or weakened area; front not as

[1] Received September 15, 1950.

above, sides either subparallel throughout (Fig. 5), or widely diverging from vertex.. 4

2. Female with anal cerci widely separated basally, but with elongate, slender, converging apical portions, the eighth sternite polished black, triangular, with tip slightly recurved (Fig. 1); abdomen moderately slender and cylindrical in both sexes, habitus wasplike..... *Polistomyia* Townsend

Not so, the female cerci broadly approximated, without fingerlike prolongations; eighth sternite of female distally broadly rounded or truncate; habitus not wasplike..... 3

3. Anal cerci of female thick, posteriorly flattened structures ("heavy blocklike and obliquely truncate"—Townsend), flattened surfaces densely covered with fine short hairs arranged in rows (Fig. 3); eighth sternite of female short and broad, distally truncate; fused anal forceps of male not deeply notched distally, sloping basad from median process; wing moderately broadly hyaline along hind margin..... *Eutrichopoda* Townsend

Anal cerci not so, thin and platelike, sparsely haired (similar to Fig. 2); eighth sternite subquadrate, broadly rounded distally; fused anal forceps of male distinctly notched distally, with short thick median process and well-developed lateral angles; wing largely infuscated, including all or virtually all of discal and apical cells... *Trichopoda* Berthold

4. Only one strong sternopleural bristle, sometimes a much weaker anterior bristle; squamae gently rounded on hind margin; a "*Plecia*-counterfeit": black wings with clear areas in submarginal, first posterior, and discal cells..... *Bibiomima* B. B.

Two or three strong sternopleural bristles; squamae broadened and squared behind, hind margin straight or even slightly concave..... 5

5. Abdomen short-ovate, heavily pollinose; hind tibia with several strong bristles basad of flattened cilia in same row, the cilia short and only on distal third or less; hind tibia with 3 long anterodorsal and 3 long posterodorsal bristles; wing nearly clear, only faintly browned anteriorly.

Atrichiopoda Townsend

Abdomen generally longer; hind tibia not with bristles basad of cilia, but with isolated cilia and hairs that gradually decrease in size to base of tibia; 1 or 2 anterodorsal and posterodorsal bristles on hind tibia..... 6

6. Wing distinctively marked, broadly bright yellow midway of wing, the distal two-fifths to half of wing infuscated, especially on costal half..... *Syringosoma* Townsend

Wing otherwise marked, either entirely infuscated along costal third to half of wing, or whole wing more or less infuscated..... 7

7. Abdomen slender, cylindrical, the thorax also proportionately slender, the general aspect of fly like a slender *Cylindromyia*.

Tapajosia Townsend

Not so, the abdomen broader, often short and oval..... 8

8. Female genitalia as in Fig. 7, the eighth sternite elongated and strongly curved; median process of fused anal forceps of male knobbed apically, as seen in posterior view; wing of male not broadened basally.

Cylindrophasia Townsend

Female genitalia not so (unknown for *Homogenia*), the anal cerci broad and platelike, and eighth sternite short and neither strongly curved nor distally sinuate; males as far as known without knobbed median process on anal forceps..... *Homogenia* Van der Wulp (=*Euomogenia* Townsend)

Pennapoda Townsend

Platyphasia Townsend

Acaulona Complex

1. Dorsocentral bristles 2 + 3, long and strong, nearly subequal, occasionally anterior presutural and anterior postsutural shorter and weaker but still distinct..... 2

Not so, usually 1 + 1 strong bristles, or 1 + 2, anterior postsutural position without a bristle..... 4

2. With more or less distinct median marginal bristles on abdomen..... 3

No median marginal bristles present (at least in female, the only sex known); cerci broad and platelike (Fig. 2).

Melanorophasia Townsend (*s. str.*)

3. Body slender, abdomen usually very slender and tapering; female cerci broad, platelike (near Fig. 2); eighth sternite of female short and inconspicuous.

Xanthomelanopsis Townsend

Body broader, abdomen relatively shorter and broader; female cerci long, slender, and tapering; eighth sternite of female long, thin, polished, curving backward at tip.

Urucurymyia Townsend

4. No distinct median marginals on intermediate abdominal segments; female genitalia as in Fig. 6, the eighth sternite modified as a stout piercer..... *Acaulona* Van der Wulp (? = *Forcipophasia* Townsend)

Distinct median marginal bristles on at least some of abdominal segments..... 5

5. Squamae boot-shaped, strongly widened posteriorly, inner angle nearly a right angle, outer angle produced; fused posterior forceps of male with a dorsoventrally flattened median process, but not deeply notched laterad of the process (female unknown to me).

Euacaulona Townsend

Squamae not suddenly widened behind, outer margin nearly straight, hind margin weakly rounded; distal margin of fused posterior forceps of male deeply notched, and median process laterally compressed with enlarged tip slightly recurved; female genitalia as in *Xanthomelanopsis*, cerci broad and platelike (near Fig. 2).... *Itaxanthomelana* Townsend

Xanthomelanodes Complex

Genus **Xanthomelanodes** Townsend (1893)

Xanthomelana Van der Wulp, Tijdschr. Ent. **35**: 189. 1892. Preoccupied.
Xanthomelanodes Townsend, Can. Ent. **25**: 167. 1893.
Erythrophasia Townsend, Ins. Insc. Menstr. **4**: 127. 1917.

Townsend's replacement name was originally proposed on the ground that *Xanthomelana* was invalidated by its close similarity to *Xanthomelon* Martens (1860) in Mollusca, a position that was soon abandoned. Later (1908) Townsend stated that *Xanthomelana* was preoccupied by *Xanthomelana* Bonaparte (1850) in Aves, and still later (1938) that it was preoccupied by *Xanthomelana* Cabanis (1851) and Waterhouse (1889), also in Aves. Accordingly, Townsend used *Xanthomelanodes* in major works in 1897, 1908, 1927, 1936, and 1938; in the same period, *Xanthomelana* Van der Wulp was used by Coquillett (1897), Van der Wulp (1903), Aldrich (1905), Adams in Williston (1908), Coquillett (1910), and Curran (1934).

The references in Aves cited by Townsend have been examined in detail. In Bonaparte (Conspectus generum avium, **1**: 446–447, 1850, the genus *Euplectes* was divided into two parts, "*Pyromelanae*" with seven species and "*Xanthomelanae*" (p. 447) with four species. These indeed appear to be intended subgenera, though headed by names in the plural. The later references cited the second name as *Xanthomelana*, usually with a reference to Bonaparte, 1850 (Cabanis, Museum Heineanum, pt. 1: 177. 1851; Waterhouse, Index generum avium: 234. 1889; Horsfield and Moore, Cat. Birds Museum East India Co. **2**: 519, 1856–1858). In Cabanis and in Horsfield and Moore, *Xanthomelana* is cited in generic synonymy, and in the second work also in a specific synonymy as "*Euplectes* (*Xanthomelana*) *xanthomelana*." Even if the name is not considered available as of 1850, which some will accept, it must still be considered as dating from some one of the other works by citation in synonymy or by indication, and accordingly sa preoccupying *Xanthomelana* Van der Wulp (1892).

It is quite probable that some of Van der Wulp's Mexican species will prove to be the same as some species in the following key. I have seen specimens from San Rafael, Veracruz, that I cannot distinguish from *arcuata* and *atripennis*, and one of Van der Wulp's species may be the same as *X. californica* Townsend. Of Van der Wulp's six species of *Xanthomelana*, *anceps* is the type of *Vanderwulpella* Townsend, and another species, *articulata*, appears to me from the description and figure to belong in *Xenophasia*, leaving four species still to be reckoned with in *Xanthomelanodes*.

Males predominate in the collections that I have seen. Of 108 available specimens of the four species included in the key, there are 81 males and 27 females.

KEY TO XANTHOMELANODES OF THE UNITED STATES

1. Legs predominantly yellow, femora entirely so or only obscurely browned at knee, tibiae partly yellow to brown; antenna almost entirely yellow..... *flavipes* (Coquillett)
   Legs predominantly black, tibiae and tarsi entirely so and femora black on distal half or more; antenna almost entirely black... 2
2. Front relatively narrow, at vertex 0.19–0.22 times the width of head (average 0.21) (eastern)..... *arcuata* (Say)
   Front broader, at vertex 0.24–0.285 times head width (average 0.246 and 0.257 for the two species)..... 3
3. Cerci of male united, with median process distally; female cerci flat, platelike, short and acutely pointed, as in *arcuata* (cf. Fig. 11); typically 3 sternopleural bristles; usually 1 strong bristle below each vibrissa (western) *californica* Townsend
   Distal margin of united male cerci arcuate, without median process; platelike cerci of female elongate and slightly hooked at apex (Fig. 10); typically 2 sternopleurals; no strong bristles near the vibrissae (eastern) *atripennis* (Say)

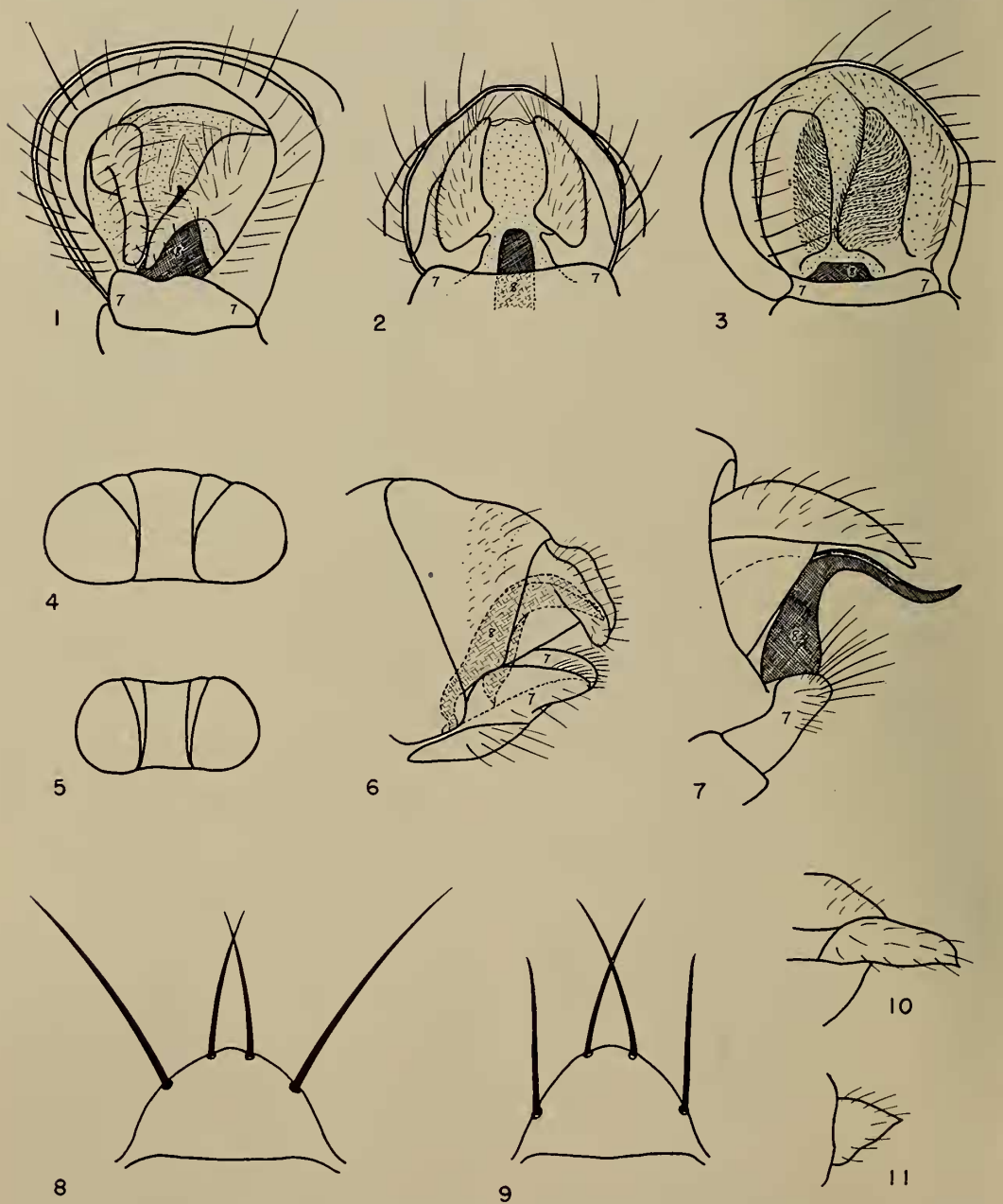
Xanthomelanodes flavipes (Coquillett)

Xanthomelana flavipes Coquillett, U. S. Dept. Agr. Div. Ent. Techn. Ser. Bull. 7: 72. 1897. (Mass.)

The distinct coloration of legs and antennae of this species stands out in the genus. The species appears to be most closely related to *arcuata*, having typically three sternopleural bristles, one bristle (the vibrissa) on each side of the face, front even narrower than in *arcuata* (0.176 and 0.186 in the two good specimens available, the type and paratype), united cerci of male with median process, and female cerci short and broad.

The few published records and available specimens are from the northeast (Mass., Vt., N. Y., Quebec).

Type male and paratype female (abdomen now missing), Horseneck Beach, Mass., August 4, 1896 (Hough). Type U. S. N. M. no. 3568. The male bears the original Museum type label and Coquillett's name label, both written by Coquillett. Inasmuch as Coquillett did not state the sex of the type, saying only "a specimen of each sex . . . Type No. 3568," some may not accept that as designating the holotype and may prefer to regard the present listing as lectotype designation.



FIGS. 1–11.—Trichopodini: 1–3, Posteroventral aspect (slightly lateral in 1 and 3) of female genitalia of *Polistomyia plumipes* (1), *Melanorophasia minuscula* s.str. (2), and *Eutrichopoda* sp. (3); 4, 5, dorsal aspect of head of *Trichopoda pennipes* (4) and *Acaulona peruviana* (5); 6, 7, side view (slightly posterodorsal in 6) of female abdomen of *Acaulona brasiliana* (6) and *Cylindrophasia simillima* (7); 8, 9, scutellum of *Xanthomelanodes arcuata* (8) and *Acaulona peruviana* (9); 10, 11, cercus of female. *Xanthomelanodes atripennis* (10) and *X. arcuata* (11).

Xanthomelanodes californica Townsend

Xanthomelanodes californica Townsend, Smithsonian Misc. Coll. **51**: 129. 1908.
? = *Stevenia pictipes* Bigot, Ann. Soc. Ent. France **42**: 254. 1888.

A small species, apparently closest to *X. arcuata*, with three sternopleurals and similar male and female terminalia, but with wider front and almost always with two pairs of bristles on the sides of the face.

Distribution: Western, Washington to California and east to Colorado, as far as known.

Stevenia pictipes Bigot from Washington Territory was placed by Coquillett (1897) as a synonym of *X. arcuata* (Say), but it might be either *californica* or *arcuata*.

Xanthomelanodes arcuata (Say)

Ocyptera arcuata Say, Journ. Acad. Sci. Philadelphia **6**: 173. 1829.

In addition to the narrow front, the species is characterized as follows: Typically three sternopleural bristles; abdomen strongly black marked, including the base, median dorsal spots on first two segments, and more of the third and fourth segments, in the female including nearly the whole tergite on the latter two segments; cerci of male united and with a median process distally; female cerci flat and platelike, short and acutely pointed (Fig. 11).

This species and *X. atripennis* have apparently been confused in many determinations because of some variation in color and in the number of sternopleural bristles. The two are quite distinct in both sexes, however, as noted in the key.

Townsend (Ins. Insc. Menstr. **4**: 126. 1917) placed *Wahlbergia atripennis* Townsend as a synonym of *arcuata*, after having regarded it in his earlier papers as a synonym of *X. atripennis* Say. From the lectotype of Townsend's species, I refer it back to *atripennis* Say (q.v.).

Distribution: Eastern, at least chiefly. Specimens before me are from Arkansas, Colorado, Illinois, Indiana, Kansas, Maryland, Massachusetts, Mississippi, New Hampshire, New Jersey, Texas, Virginia, Wisconsin. A headless specimen from San Rafael, Veracruz, Mexico, and a single specimen from Seattle, Wash. seem to belong here also.

Xanthomelanodes atripennis (Say)

Phasia atripennis Say, Journ. Acad. Sci. Philadelphia **6**: 172. 1829.
Wahlbergia atripennis Townsend, Proc. Ent. Soc. Washington **2**: 145. 1891. (D. C.).
Erythrophasia atripennis Townsend, Ins. Insc. Menstr. **4**: 127. 1917.

This species is sometimes confused with *X. arcuata*, as noted under that species, but is quite distinct in both sexes. The front is broader, at the vertex 0.245–0.285 times the width of the head (average 0.257); abdomen predominantly deep yellow to orange, sometimes with a dorsal row of obscure, indistinctly bounded brown spots, and occasionally discolored apically.

The history of the species has been somewhat confused by the use of the same specific name, *atripennis*, in three independent proposals, plus the fact that Townsend for many years considered his 1891 species a synonym of Say's species, and then later referred it to *arcuata* and redescribed Say's species as *Erythrophasia atripennis*. In my opinion all three are the same species. Types of both of Townsend's names are before me, and although Say's descriptions are inadequate from modern standards, the presence of only two common eastern species makes it possible to identify them with reasonable certainty.

I question the synonymy of *Tachina corythus* Walker, which Coquillett (1897) placed as a synonym of *X. atripennis* (Say). Walker's description states that the palpi of *corythus* are black and the wing dark gray with brown stripes along the veins, which does not sound like *Xanthomelanodes* at all.

Distribution: 38 specimens are before me from Arkansas, District of Columbia, Florida, Georgia, Maryland, New Jersey, and Virginia. One specimen from San Rafael, Veracruz, also seems to belong here. Most of the specimens were collected in August and September.

The four specimens of the original type series of *Wahlbergia atripennis* Townsend have been examined, one in the collection of the U. S. National Museum, and three from the Snow Collection, University of Kansas, lent through the courtesy of Dr. R. H. Beamer. All four are males. One in the Snow collection has been labeled as, and is hereby designated as lectotype, the other three as lectoparatypes.

Xanthomelanodes brasiliensis Townsend

Xanthomelanodes brasiliensis Townsend, Rev. Chilena Hist. Nat. **32**: 371. 1929.

In the type series before me I hereby designate as lectotype a male, Itaquaquecetuba, São Paulo,

Brazil, December 6; lectoallotype, May 6, and three lectoparatypes, May 21 (♂), May 29 (♂), June 3 (♀), all topotypic (C. H. T. Townsend). All specimens have Townsend name labels, and the lectotype and lectoallotype bear red labels as "Type," but in this case Townsend failed to specify which was the holotype, either by publication or label.

Trichopoda Complex

Trichopoda typica: Postcoxal area membranous

In this typical division of the *Trichopoda* complex the dorsal aspect of the head is characteristic, the front narrowed above with sides of front parallel on basal half, then suddenly diverging (Fig. 4); no outstanding median marginal bristles on intermediate abdominal segments, all marginal bristles being short and subequal; apical cell either short petiolate or closed at margin of wing, in either case the juncture with costa is slightly before the apex of the wing; hind crossvein more or less sinuate; hind tibia dorsally with long, flattened, scalelike cilia.

Genus **Trichopoda** Berthold

Trichopode (vernacular!) Latreille. Familles naturelles du règne animal: 498. 1825. ("*Thereva lanipes*, F.; ejusd., *t. plumipes*.")

Trichopoda Berthold, German translation of Latreille (1825), as "Natürliche Familien des Thierreichs mit Anmerkungen und Zusätzen von Dr. Arn. Ad. Berthold": 508. 1827. ("*Thereva lanipes*, Fab. *Thereva plumipes*, dess.")

Trichiopoda Latreille, Règne animal **5**: 512. 1829. (*Thereva plumipes* and *lanipes* of Fabricius, with several other species.)

Trichopodopsis Townsend, Journ. New York Ent. Soc. **21**: 148. 1913.

This genus has often been cited as *Trichiopoda* Latreille, but the first publication in proper Latinized form was by Berthold in translating Latreille (1825). The generic names in Latreille's work are in the vernacular, and cannot be accepted; it seems, therefore, that the name must be credited to Berthold (1827) with the spelling *Trichopoda*.

Townsend recognized *Trichopodopsis* for *T. pennipes* (Fabricius) and related species, but my studies have furnished no support for segregating these species from typical *Trichopoda* s. str.

The genus is widely distributed in the Nearctic and Neotropical Regions. Despite the commonness of some of the "species," there are still some puzzling problems of color pattern and possible erroneous association of sexes.

Genus **Eutrichopoda** Townsend

Eutrichopoda Townsend, Smithsonian Misc. Coll. **51**: 134. 1908.

The distinctive female cerci (Fig. 3) suggest that this group deserves separate status. The few specimens known to me are Neotropical except for one example from Panama City, Fla.

Eutrichopoda abdominalis Townsend, Rev. Chilena Hist. Nat. 32: 371. 1929. Lectotype female, here designated, "Mb. [Moyobama, Peru] 13.XI Rio Mayo Foliage." Lectoparatype, male, "Fls. Baccharis g Itq. 3.VI" [Itaquaquecetuba, São Paulo, Brazil, June 3, on flowers of *Baccharis genistelloides*]. Both in U. S. National Museum. The female was selected as the lectotype after studies showed that *Eutrichopoda* is probably a valid grouping based on the form of the female genitalia. The male is the one associated by Townsend, but I am not sure that the association is correct.

Trichopoda atypica: Postcoxal area closed

Genera of the *Trichopoda* complex, which are atypical with respect to the postcoxal area, also have the following characteristics: In dorsal aspect, the sides of the front either subparallel throughout (as in Fig. 5) or widely diverging from the base; abdominal segments generally with strong erect median marginal bristles (absent in *Atrichiopoda* and perhaps in some others; small in *Pennapoda;* may be smaller in females than in males of same species); apical cell open, either broadly or narrowly, occasionally closed at margin, and rarely (*Bibiomima*) petiolate, in any case the third vein curving posteriorly so that it ends precisely at the apex of the wing and not before (slightly atypical in *Platyphasia*); hind crossvein more or less sinuate; cilia on hind tibia usually short and confined to the distal third to half of the tibia, much less conspicuous than in the typical *Trichopoda*.

I suspect that some of the genera included here should be synonymized, but until the classification in this group is much clearer than at present it seems best to identify them as far as possible with present information. Several genera, such as *Atrichiopoda* and *Syringosoma*, have a rather distinctive habitus, but one can find little of real consequence for a generic characterization. *Cylindrophasia* has distinctive female genitalia (Fig. 7), but it would not be difficult to regard the structure as an unusually extreme development of some other genus. It seems indeed to be an

intermediate step toward the stout piercer, such as found in *Acaulona* (fig. 6). The male genitalia of *Tapajosia* are quite similar to those of *Cylindrophasia*, differing only in having the median process of the fused anal forceps extremely slender. Both have a cylindrical body, and the two may be synonymous. The female of *Tapajosia* is unknown to me. *Platyphasia* is distinctive in the male sex by having an abrupt right-angled bend in the median process of the anal forceps, as viewed in profile.

Acaulona tehuantepeca Townsend (Smithsonian Misc. Coll. 51: 130. 1908) from the holotype in the U. S. National Museum, is not an *Acaulona* but belongs here. The female genitalia agree with those of *Cylindrophasia*, and *tehuantepeca* is thus referred to that genus on present information.

Dallasimyia Blanchard (Rev. Argentina Ent. **2**: 7. 1944) is not included in the key; it may be near *Cylindrophasia*, but it may also fall with the several concepts at the end of the key (*Homogenia* et al.).

Genus **Homogenia** Van der Wulp

Homogenia Van der Wulp, Tijdschr. Ent. **35**: 184. 1892.
Euomogenia Townsend, Smithsonian Misc. Coll. **51**: 132. 1908.

The relatively few specimens before me, with the broad wings typical of the genus, are all males, and one can suspect that the females may be narrow-winged and presently classified elsewhere. Even the broad wing of the male may not be a constant character, for a male from Argentina with typical genitalia, open apical cell, and broad front, has only a moderately wide wing.

Euomogenia Townsend is a synonym in my opinion; the anal angle is folded under in the type of the genotype, *E. lacteata*, so that the wing appears narrower, and the apical cell is closed at the margin of the wing. A later species, *E. dysderci* Townsend, has a very broad wing with apical cell widely open. I refer both species to *Homogenia*.

Euomogenia dysderci Townsend, Revista Ent. **7**: 317. 1937. Lectotype male, here designated, Campinas, Brazil. Bears the name label and a red label "Type Ht. ♂," by Townsend.

Acaulona Complex

The genera that fall in this complex are extremely difficult to separate satisfactorily, yet there are a few features of the female genitalia that indicate some valid distinctions.

Genera **Xanthomelanopsis** and **Urucurymyia** Townsend

Xanthomelanopsis Townsend, Ins. Insc. Menstr. **4**: 126. 1917.
Urucurymyia Townsend, Revista Ent. **4**: 206. 1934.

These two genera, separated from others in the complex by the stronger chaetotaxy, have quite a different habitus from each other, and the different female genitalia also suggest that they are indeed distinct. As often the case in this tribe, however, it is difficult to find good generic characters. The peculiar appearance of the end of the abdomen in the two available females of *Urucurymyia*, giving an "urn-shaped" appearance (Townsend), may possibly be a distortion that is not necessarily typical. The narrow frontalia of the genotype of *Xanthomelanopsis*, *X. peruanus* Townsend, seems quite distinct, for the frontal stripe at its narrowest is only 1.6–1.9 times the parafrontal directly opposite, whereas in *Urucurymyia* the frontal stripe is approximately four times the parafrontal. However, a species of *Xanthomelanopsis* from Mexico is intermediate (proportion nearly three times), and that distinction is therefore weakened. The femae genitalia of *Xanthomelanopsis peruanus* are similar to the figure for *Melanorophasia* (cf. Fig. 2), though the cerci are nearly quadrate and the eighth sternite is short and inconspicuous.

It is perhaps worthy of special mention that *Xanthomelanopsis* is far removed generically from *Xanthomelanodes*, despite the similarity of name and the fact that the genotype of *Xanthomelanopsis* was originally described as *Xanthomelanodes*. The resemblance is only one of general habitus and common tribal characteristics.

Genus **Melanorophasia** Townsend

Melanorophasia minuscula Townsend

Melanorophasia minuscula Townsend, Revista Ent. **4**: 205. 1934. (Urucurytuba, Brazil; "3 ♂♂, 2 ♀♀".)

When the type series was examined for the purpose of selecting a lectotype, the writer at once noted that the abdomen of the so-called males did not have the usual appearance of males of this tribe, and it was suspected that all specimens in the type series were actually females. Dissection proved this to be the case. What was even more surprising, however, was that *two* different species of females were involved. The three "males" of Townsend have distinctly different genitalia from the two females, besides

which the former have entirely black legs, whereas the latter have the hind tibia basally and all femora toward the base yellow. A further difference is that the "males" have a full complement of dorsocentral bristles, whereas the females have a reduced number.

The lectotype of *M. minuscula* Townsend is the female, Urucurytuba, Rio Tapajós, Brazil, April 13 (Townsend), labelled by Townsend as "Ht ♂," and so designated in his *Manual of myiology* **7**: 22. 1938. Paratopotypes: 2 ♀ ♀, April 4 and 11. Female genitalia as figured (Fig. 2).

The other two specimens from the original type series, which do not seem to be congeneric with *M. minuscula* as here restricted, are left unnamed for the present. Until much more material is available and both sexes known throughout the tribe, and accordingly a generic classification can be better worked out, it would add nothing to describe these and guess at their generic position.

Regarding the genotype of *Melanorophasia*, it might be argued that in a case of this sort the genus is based on a composite species, and a later author is free to select either of the components as genotype. In my view, the genotype is automatically the named or monobasic species as finally restricted by a subsequent author. To be absolutely sure, in the present case, I hereby state that the genotype is *M. minuscula* as restricted above to the lectotype female.

The above actions were necessary to clear the nomenclature of the genus. Whether *Melanorophasia* deserves recognition at all, either as a genus or as a subgenus, is another matter and one upon which there is not sufficient information for judgment.

Genus **Euacaulona** Townsend

Euacaulona Townsend, Smithsonian Misc. Coll. **51**: 131. 1908.

The combination of shape of the squamae, distinct median marginal bristles, and type of male genitalia suggest that this may be a good genus, but material is limited. I have before me only the holotype of *E. sumichrasti* Townsend and two males of another species. Three females that key to this genus have genitalia unlike anything that I have seen in this tribe, and if they prove to be *Euacaulona*, their distinctness will be another argument in favor of recognition. These females are apparently not conspecific with any of the known males, however, and accordingly I cannot be sure of their position until I have males to associate with them, or known females of *Euacaulona* with which to compare.

It would also not be at all impossible that *Euacaulona* is merely based on males of *Acaulona* that are extreme in the bristling on the abdomen and in the width of the squamae.

Genus **Itaxanthomelana** Townsend

Itaxanthomelana Townsend, Rev. Mus. Paulista **15**: 214. 1927.

This genus cannot be keyed out in Townsend (Manual of myiology **3**: 50. 1936) because, contrary to the statement in his couplet 5 and again in the Manual (vol. 7, p. 21), there are no distinct median marginal bristles on the first abdominal segment, and the following two segments have median marginals and not a row of marginals. This is true in both sexes.

If the dorsocentral bristles were not considered significant, the presence of median marginals and the type of both male and female genitalia would key it to *Xanthomelanopsis*, but these two are quite distinct in general habitus. The female genitalia are approximately like those figured for *Melanorophasia* (cf. Fig. 2), the cerci somewhat broader and subquadrate and the eighth sternite broader and shorter. Despite the similarity of name, *Itaxanthomelana* is nearer to *Acaulona* than to *Xanthomelana*.

One specimen before me from Itaquaquecetuba, São Paulo, Brazil, was reared from *Dysdercus*.

Genus **Forcipophasia** Townsend

Forcipophasia Townsend, Revista Ent. **5**: 216. 1935. (Brazil).

This genus was described from a single female having "hypopygium forcepslike." If I interpret the description correctly, however, this is the same type of genitalia found in *Acaulona* (Fig. 6), and the suspicion is strong that *Forcipophasia* may be merely the female of species of *Acaulona*, perhaps based on a specimen in which the genitalia were especially protruding and distinct. Without knowledge of the type, I cannot place it.

Genus **Acaulona** Van der Wulp

Acaulona Van der Wulp, Biologia Centr.-Amer., Zool., Dipt., **2**: 4. 1888.

Acaulona s. str. has the female eighth sternite modified as a strong, black, rather large and conspicuous, piercing sternotheca, strongly recurved so that in profile the distal half is at right angles to the basal portion, deeply grooved above and ending acutely between the approximated tips of the anal cerci (Fig. 6); anal cerci narrow, somewhat elongated, with their apices approximated forcepslike, and approaching or overhanging the seventh sternite so that as seen in profile the cerci and the seventh sternite also appear forcepslike. This is the characteristic form of the female genitalia as found in *A. brasiliana*, *A. peruviana*, *A. erythropyga*, n. sp., and in Mexican material determined by Townsend as *A. costata* Van der Wulp. This type of genitalia seems to be an intermediate step to the phasiine type with strong piercer found in such genera as *Hyalomya*, *Alophorella*, and *Phasiomyia*.

For those who may be tempted by the admittedly close similarity of habitus and general morphology to synonymize some of the other genera of this complex under the older *Acaulona*, it may be noted that *Xanthomelanopsis*, *Melanorophasia s. str.*, and *Itaxanthomelana* have quite a different type of female genitalia, with broad, flat, platelike cerci and the eighth sternite thin, flat, apically rounded and not recurved (Fig. 2). *Urucurymyia* and *Melanorophasia* (atypical part) are slightly different from the last three genera, but are certainly much closer to them than to *Acaulona*. The female of *Euacaulona* is not known to me. Since the type of genitalia found in *Xanthomelanopsis* et al. indicates that the eggs are laid on the body of the host rather than inserted as by *Acaulona*, this difference in reproductive habit suggests that the "*Acaulona* complex" of this paper is not a natural grouping. However, with so many points still unknown from lack of reared material, positively associated sexes, etc., it seems futile to revise further at this time. If the present arrangement proves useful in aiding identification, or in avoiding misidentifications, it will have served its immediate purpose.

Acaulona brasiliana Townsend

Acaulona Townsend, Revista Ent. 7: 316. 1937. (Campinas, São Paulo, Brazil; parasite of *Dysdercus*.)

The abdomen, as Townsend clearly indicated, is characteristically marked, being mainly dark yellow with a median dorsal row of more or less distinct brown to blackish triangles, the apices directed cephalad. The species is close to *A. peruviana* and it is difficult to find concrete differences. In the series of the two before me, *brasiliana* averages slightly larger, and females are usually darker, though some females have entirely yellowish abdomen. The frontal stripe is slightly wider, two to three times the width of the parafrontal.

Five paratypes (4 ♂♂, 1 ♀) are before me, as well as about two dozen specimens from São Paulo, Brazil, and Bompland (Misiones Territory), Chaco, and Santiago del Estero, Argentina, all reared from *Dysdercus*.

Acaulona peruviana Townsend

Acaulona peruviana Townsend, Est. Exp. Agr. Soc. Nac. Agraria (Lima, Peru), Bol. 1: fig. 3 and p. 7. 1928.

Species with pale habitus, predominantly yellow; scutellum chiefly yellow, usually only narrowly infuscated basally; abdomen mainly yellow with a narrow median brown to blackish stripe on the dorsum, widening slightly on the posterior margin of each tergite beyond the first to form a subtriangular spot, a pattern more pronounced in the female than in the male; tergites 4 and 5 of male conspicuously pollinose, the others more or less shining; in female the fifth tergite polished, fourth large and pollinose, and some pollen on middle of segments one to three, decreasing anteriorly; all coxae yellow; hind femora yellow on basal third to two-thirds, mid on basal fourth to half, fore narrowly yellow at base if at all, legs darker in females than in males.

Parafrontalia relatively broad, and frontalia correspondingly narrow, compared with other species, the relative width of frontalia to parafrontalia across apex of former 1.7 to 1.75 times in the males and 1.8 to 2.2 in the females; female genitalia approximately as figured for *A. brasiliana* (cf. Fig. 6).

Length, 4 to 6.5 mm.

Neotype, male, "Tmb R. [Río Tambo, Peru], 31.V Fls. Euphorbia." Neallotype, same data, May 30. Neoparatypes: 11 (8 ♂♂, 3 ♀♀), same data, May 29, 30, 31; 1 ♀, Sullana, Peru, February 17, 1912; 1 ♀, Chincha, Peru, April 5, "Fls. Euphorbia"; 1 ♀, Zomate, Peru, November 18, "Fls. Telanthera sp."; 1 ♀, Cañada Zamán, Peru, February 14, 1912, "Fls. Ph. flava"; 1 ♀, "Peru"; 1 ♂, Chapairá, Peru, May 21, 1911 (all collected C. H. T. Townsend). The Neallotype

bears Townsend's own determination label as "*Acaulona peruviana* TT ♀."

Type, U. S. N. M. no. 60133.

It is essential to fix the name of this species because it is an important parasite of *Dysdercus* in Peru, and attempts have been made to introduce it elsewhere. Townsend never published a formal description of it, but the name was nevertheless validated in connection with the full-page figure published by Townsend in the Boletin cited above. Additional information published at that time located the species in the coastal valleys of Peru as a parasite of *Dysdercus*.

Recent attempts to recover the species after its introduction into Puerto Rico in 1941 and 1942 have so far been negative, though a new and apparently native species has been discovered (see *A. erythropyga*). It is possible that *Acaulona* spp. are host specific, or if not strictly so, at least the Puerto Rican species of *Dysdercus* may be too distantly related to the Peruvian species for the parasites to transfer. There are no species of *Dysdercus* common to Peru and Puerto Rico, according to my colleague Dr. R. I. Sailer.

Neotype designation is not yet recognized by the International Rules, and there will probably be considerable opposition. Certainly the practice is open to abuse, and to merit recognition some clear standards should be insisted upon and rigidly adhered to. If the designation of holotypes and lectotypes has any value and reason for being, much the same value and reason seem to apply also to the designation of neotypes. The major difference is that for neotypes a much graver responsibility rests with the taxonomist who presumes to select a standard of reference (neotype) to replace the original standard for the species (holotype, or by subsequent action, lectotype).

It is my conviction that a neotype should be required to satisfy all of the following requirements, as far as possible: (1) Agreement with the original description, with any redescriptions of the holotype, and with any known figures, photographs or notes on the type; (2) recognition of and agreement with a previous published restriction, or with the oldest if there are several, even though the restriction was not accompanied by a lectotype or neotype designation in a present-day sense; (3) topotypic material, to the extent that the locality is known, and also in the same stratum for paleontological material; (4) for neozoology, the same time of year, same sex, and same host plant or animal as the original, if any or all of these are known; and (5) neotype deposited in the same collection as the original, or in whatever collection or institution the original collection is presently located. In other words, a neotype must and should duplicate the original conditions as nearly as possible.

It would usually be impossible to find an author's original but nontypical material, or perhaps even other material determined by him as the species in question, and thus it would be impracticable to insist on these requirements, but if such material existed, it would certainly be highly desirable and appropriate to utilize that as a neotype series.

The neotype series selected above for *Acaulona peruviana* fulfills all of the above requirements. Of particular importance is the fact that the present series is composed of specimens collected and identified by Townsend himself, and quite possibly intended to be the type series, but for some reason left undescribed in a formal way.

Acaulona tehuantepeca Townsend

Acaulona tehuantepeca Townsend, Smithsonian Misc. Coll. **51**: 130. 1908. (Mexico.)

The type of this species, a female, has short, flattened cilia on the hind tibia and hence will fall in the *Trichopoda* complex rather than in *Acaulona*. Even if the evidence of the flattened cilia is disregarded or overlooked, the species still cannot be placed in *Acaulona*, for the female genitalia are like those of *Cylindrophasia*, to which genus the species has been referred elsewhere in this paper.

Acaulona erythropyga, n. sp.

♂, ♀. A typical *Acaulona*, agreeing with generic diagnosis of Townsend (Manual of Myiology **7**: 9, 1938) except in darker color, narrower frontalia, and slightly developed abdominal macrochaetae.

Predominantly blackish, in contrast to the yellow to orange habitus of other known species. *Head* with occiput, frontalia chiefly, and antenna black, tip of palpus infuscated, face and cheek yellow with whitish pollen, and parafrontal black in ground color but whitish to pale yellow pollinose. *Thorax* black with whitish-gray pollen, that on mesonotum outlining the usual pattern of three broad black stripes. *Abdomen* chiefly black, in the female tergites 4 and 5 and the hypopygium bright reddish yellow and strongly

contrasting with the rest of the abdomen, in the male these tergites black dorsally and sometimes laterally but usually more or less reddish at least on the extreme sides of tergites, male hypopygium reddish. *Legs* black; claws brown with black tips; pulvilli yellow. *Wing* lightly infuscated throughout, slightly darker on anterior (costal) two-fifths; squama white; halter light yellow.

Width of front at vertex 0.31–0.35 times the width of head; width of frontalia just above antennal bases 2–2.2 times the width of a parafrontal at the same level; third antennal segment slightly longer than the second, as 5:4; sternopleural bristles two, with a weak third in some specimens; marginal bristles on abdominal segments slightly developed, with a pair of widely separated median marginals that are weakly distinct, more so in males than in females; apical cell of wing closed at margin or very narrowly open.

Genitalia: Characteristic *Acaulona* type, the female approximately as figured for *A. brasiliana* (Fig. 6); anal forceps of male with straight, slightly tapered median process.

Length, 5–6 mm.

Holotype, male, Guayanilla, Puerto Rico (W. Gaud; reared from *Dysdercus andreae* (L.), P.R. No. 2578). Allotype, and 12 paratypes (7 ♂♂, 5 ♀♀), same data. "Emerged November 26 to January 25 in R.[earing] Cage 78, which contained numerous host adults and nymphs from fruits and twigs of *Thespesia populnea* along Road 36 at Km. 4.2, near where *Acaulona peruviana* Tns. and *Hyalomya chilensis* Macq. had been liberated in 1941."

Other paratypes (all Puerto Rico): 2 (♂, ♀), Guayanilla, September 21, 1945 (H. K. Plank); 1 ♂, Guayanilla (Gaud), emerged August 11, 1949, from *D. andreae*; 2 (♂, ♀), Guanajibo, near Mayagüez, August 5, 1947, reared from *Dysdercus sanguinarius* Stål; (3 ♂♂, 3 ♀♀)*, Guayanilla (Gaud), emerged September 26–30, 1949 from *D. andreae*; 1 ♀*, Guayanilla (Gaud), emerged September 26, 1949 from *D. andreae*; 2 ♂♂*, Guayanilla (Gaud), emerged November 9 and 28, 1949 from *D. andreae*; 4 (2 ♂♂, 2 ♀♀)*, Guayanilla (Plank), emerged December 22, 1949–January 16, 1950 from *D. andreae*.[2]

Type, U. S. N. M. No. 60134. Paratypes will also be deposited in the British Museum (Nat. Hist.), American Museum of Natural History, and H. J. Reinhard collection.

[2] Specimens marked with asterisk were reared from hosts collected as noted for the topotypic series.

ENTOMOLOGY.—Sigmactenus, *a new genus of flea from the Philippines.*[1] Robert Traub, Major, MSC.[2] (Communicated by C. W. Sabrosky.)

The Chicago Natural History Museum Expedition to the Philippines, 1946–1947, which operated under the direction of Harry Hoogstraal, collected a most interesting flea, which is here described as a new genus.

Family Leptopsyllidae

Subfamily Pectinocteninae

Sigmactenus, n. gen.

Near *Pectinoctenus* Wagner, but with upper end of comb of head distant from antennal groove and curved backwards; labial palpi extending much below apex of maxillary palpi; frontal tubercle absent; first segment of female antenna shorter than club.

Caput fractum. Upper end of head comb relatively near the anterior margin of head; with an interspace between apices of upper spines and antennal groove, in female this space is as broad as these spines are long, shorter in male. Vestigial eye moved far towards top of head, along with comb; nearer to antennal groove than is the tip of the upper spine. In female, upper spine farther from anterior margin of head than second or third by virtue of translucent base; less so in male; the comb somewhat resembling the letter S (hence the generic name). The area above the comb (frons) different in structure from the area anterior to the comb (clypeus). Frons with a horizontal row of six bristles; below the row two larger ones between the anterior three bristles or between second and fourth bristles; the row continued downwards as a submarginal clypeal row of thin bristles. Immediately in front of the comb a downward row of two bristles, one at level of midpoint of comb. Internal in-

[1] Published under the auspices of the Surgeon General, U. S. Army, who does not necessarily assume responsibility for the professional opinions expressed by the author. Received September 12, 1950.

[2] From the Army Medical Service Research and Graduate School, Washington, D. C.